

REMARKS

Applicant thanks the Examiner for the thorough consideration given the present application. Claims 1-15 are currently being prosecuted. The Examiner is respectfully requested to reconsider his rejections in view of the amendments and remarks as set forth below.

Rejection Under 35 U.S.C. § 112

Claims 4, 5, and 11 and 14 stand rejected under 35 U.S.C. § 112, second paragraph. These rejections are respectfully traversed.

In regard to claims 4 and 5, the Examiner suggests that the engagement portion "includes" a recess. By way of the present Amendment, this language has now been utilized. In regard to claim 14, the Examiner feels that there is insufficient antecedent basis for "the recess". By way of the present Amendment, the reference has now been made to "engagement portion" rather than "recess". Accordingly, Applicant submits that this rejection is now overcome.

Rejection Under 35 U.S.C. § 102

Claims 1-7 and 12 stand rejected under 35 U.S.C. § 102 as being anticipated by Shimizu (U.S. Patent No. 5,034,640). This rejection is respectfully traversed.

First, concerning the rejection of claim 12, it is not understood how dependent claim 12 can be rejected as being anticipated by the reference while independent claim 11 from

which it depends is rejected only as being obvious thereover. If the Examiner persists in this rejection, he is requested to explain this.

In regard to claim 1, the Examiner states that the Shimizu reference shows a motor with a tubular housing 20 and an end cap 1. The end cap has a boss portion, a flange, an engagement portion and a finger. However, Applicant disagrees with the Examiner that this reference teaches the terms of the claimed invention.

Claim 1 describes a miniature electric motor having a combination of elements including a tubular housing, at least one end cap, the end cap having a boss portion, a flange and an engagement portion, the housing having at least one circumferentially extending finger which is radially deformed into contact with the engagement portion and where the engagement portion includes an axially projecting ridge. Applicant submits that the reference does not teach this combination of elements. In particular, while the reference shows a finger which is deformed to engage the end cap, the finger is axially extending rather than circumferentially extending. Although the reference includes a recessed portion for receiving this finger, the bottom surface of the recess is sloped to receive the end of the finger. The Examiner has equated this as a ridge. However, Applicant disagrees that this is any form of a ridge, and believes that the reference does not teach any kind of an axially projecting ridge as defined in the claim. Further, when the finger of the reference is bent, the bending is in a different direction from that of the present invention and does not appear to be radially deformed but is better described as being

axially deformed. In view of this, Applicant submits that the reference does not teach the combination of elements described in claim 1, and accordingly, claim 1 defines thereover.

Claims 2-10 depend from claim 1, and as such, are also considered to be allowable. In addition, many of these claims recite other features which together with the combination of elements of independent claim 1 are further allowable. Thus, in claim 2, the reference does not show a ridge which is circumferentially extending. In regard to claim 3, the reference does not have a radially planar portion from which the ridge projects. In regard to claim 5, the ridge is not formed along the outer peripheral edge of the recess. In regard to claim 6, the ridge does not have an outer chamfer. In regard to claim 7, there is no shearing of the ridge due to the engagement of the ridge and the finger. In regard to claim 8, the finger does not have an axially inner edge since it extends in the axial direction. In addition, there is no inner edge which is tapered. In regard to claim 9, the reference does not show T-shaped holes. In regard to claim 10, it appears that each engagement portion does not accommodate a pair of fingers.

Rejection Under 35 U.S.C. § 103

Claims 8-11, 13 and 14 stand rejected under 35 U.S.C. § 103 as being obvious over Shimizu in view of Masrodonato et al. (U.S. Patent No. 3,732,616). This rejection is respectfully traversed.

The Examiner cites the Masrodonato et al. reference to show an electric motor where fingers are provided to engage the end cap. However, it is noted that in this

reference, the fingers only engage the outer surface of the end cap to keep it from falling outwardly. As seen in Figure 20, the lower edge of the end cap is at the same level as the top edge of end plate 58.

Claim 11 is a method claim which describes a combination of steps for connecting an end cap to a tubular housing to a motor, including providing an end cap with a flange, a boss portion, and an engagement portion, providing a tubular housing with at least one circumferentially extending finger, inserting the boss portion into the housing so that the flange abuts an axial end and the engagement portion is aligned with a finger, providing an axially projecting ridge and deforming the finger so that the axially inner edge of the finger axially engages the ridge. Applicant submits that the combination of the two references does not show the combination of steps described by claim 11.

In particular, claim 11 includes a circumferentially extending finger. Shimizu does not show such a finger, but rather shows an axially extending finger. Masrrodonato et al. includes circumferentially extending fingers but these are not aligned with the engagement portion of the end cap and instead merely lie on top of the end cap. Thus, even if the two references are combined, there is no teaching of using a circumferentially extending finger which is deformed radially so as to engage a ridge on the engagement portion. Further, it is noted that neither of the references teach an actual ridge which projects axially. For these reasons, Applicant submits that claim 11 is likewise allowable.

Claims 12-15 depend from claim 11 and as such are also considered to be allowable. In addition, these claims recite other additional steps including the shearing of

the ridge, providing a tapered surface, and providing fingers with inclined axially inner edges in contact with axially outer surfaces of the ridge. Accordingly, these claims are considered to be additionally allowable.

In regard to claims 8-10, Applicant submits that these claims are likewise allowable based on their dependency from claim 1 even over this combination of references.

CONCLUSION

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied on by the Examiner, either alone or in combination. In view of this, reconsideration of the rejections and allowance of all the claims are respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mr. Robert F. Gnuse (Reg. No. 27,295) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

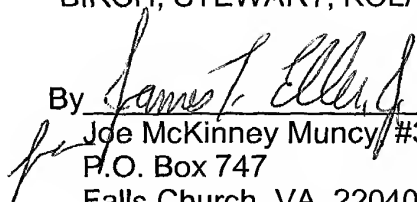
Appl. No. 10/077,974
Attorney Docket No. 1928-0125P
Amendment filed December 19, 2002

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 4, 11, 12 and 14 as follows:

4. (Amended) The motor of claim 1, wherein the end cap is a molded resin body and the engagement portion [is] includes a recess formed in the flange and boss portion into which the finger is deformed.

11. (Amended) A method of connecting an end cap to a tubular housing of a miniature electric motor, the method comprising the steps of

providing an end cap with a flange [portion], a boss portion and at least one engagement portion,

providing a tubular housing with at least one circumferentially extending finger,

inserting the boss portion of the end cap into the housing such that the flange abuts an axial end of the housing and the [recess] engagement portion is aligned with the finger,

and [by] providing an axially projecting ridge on the engagement portion and deforming the finger radially so that an axially inner edge of the finger axially engages the ridge to prevent axial movement of the end cap with respect to the housing.

12. (Amended) The method of claim 11, wherein [the step of deforming the finger includes shearing] a part of the ridge is sheared by the finger thereby firmly holding the end cap to the housing.

14. (Amended) The method of claim 11, including the steps of providing [two] a plurality of pairs of said fingers and radially deforming each pair of fingers into a respective engagement portion of the end cap, each finger having an axially inner edge which extends at an incline to a plane orthogonal to an axis of the housing, the axially inner edge being brought into contact with an axially [inner] outer surface of the [recess] ridge by radially deforming and continuing to radially deform the finger causing the inner edge of the finger to exert an axial force on the [surface] ridge of the [end cap] engagement portion to clamp the end cap to the housing.

Claim 15 has been added.